4.0 Baseline Habitat Data

Baseline habitat data is currently being compiled for salmonids in Washington. The Washington State Conservation Commission, in consultation with local government and treaty tribes, is developing limiting factors reports on habitat conditions in Water Resource Inventory Areas (WRIAs) throughout the state[4]. The intent of these *Habitat Limiting Factors* reports is to help local organizations collect data and identify gaps in existing information on factors affecting natural salmonid production. The reports may be considered the environmental baseline for salmonid habitat in Washington.

This habitat data collection began under Engrossed Substitute House Bill (ESHB) 2496, which was passed by the Washington State Legislature and signed into law in 1998. The resulting law was codified in Revised Code of Washington Chapter 77.85 RCW (Salmon Recovery). Its purpose is "to identify the limiting factors for salmonids," where "limiting factors" are defined as "conditions that limit the ability of habitat to fully sustain populations of salmon." The statute further clarifies the definition by stating, "These factors are primarily fish passage barriers and degraded estuarine areas, riparian corridors, stream channels, and wetlands." Implementation of RCW 77.85 does not constitute a full limiting factors analysis. It does, however, represent Best Available Science (BAS). Hatchery, hydroelectric, and harvest segments of identified limiting factors are covered in other forums.

The Legislature directed the Commission to form Technical Advisory Groups (TAGs) to write the reports. The TAGs consist of private, federal, state, tribal, and local government personnel with appropriate expertise. To date, the TAGs have completed several *Habitat Limiting Factors* reports, which are developed on a WRIA basis. Washington State contains 62 WRIAs; 26 reports are complete; 12 are currently underway; and 24 are not yet begun. The completed *Habitat Limiting Factors* reports are located in Appendix A of this BR. Appendix A is a separately bound volume.[5]

4.1 WRIA Based Data

For the *Habitat Limiting Factors reports,* each WRIA is subdivided into separate watersheds or sub-basins. Each chapter presents data on habitat-limiting factors for each watershed or sub-basin. Following are examples of limiting factors:

- Watershed characteristics and conditions (location, topography, climate, hydrology, geology and groundwater movement, soils and vegetation)
- Historic and current land use
- Access to spawning and rearing habitat
- Floodplains and channel conditions

[4] Water Resource Inventory Areas were established in the early 1970s by the state of Washington for the purpose resource planning and management. A WRIA is essentially an administrative unit that closely follows watershed boundaries. There are 62 WRIAs is Washington state (WAC 173-500-040).

[5] Contact the Washington State Conservation Commission for full text copies of these reports. Maps included in the reports were created and will be updated by the Commission.

- Riparian conditions
- Water quality
- Exotic and opportunist species
- Biological processes
- Estuarine and nearshore habitat.

Table 21, summarizes the specific known habitat limiting factors in each WRIAs in Washington state (i.e., the environmental baseline). Baseline data includes such information as location, sub-basins, land use, zoning, nearshore habitat and forage fish, known and presumed distribution of aquatic species, barriers, structural elements, channel characteristics, water quality, instream flow, riparian condition, watershed health and other data.

This WRIA-based data is drawn from the following sources:

- Formal habitat inventories or studies specifically directed at evaluating fish habitat.
- Other watershed data not specifically associated with fish habitat evaluation.
- Personal experiences and observations of watershed experts involved in the TAGs.

Few, if any, of the habitat data or observations meet the highest standard of peer review literature. However, they should nevertheless be considered presumptively valid because they are based on the experiences of the watershed experts actively working within these areas. Future peer review and research of data gaps will require additional watershed research or evaluation by the Commission.

4.2 Findings on Salmonid Habitat in Washington State

Although the data was scattered, and the specific habitat concerns differed among WRIAs and streams within the WRIAs, some common habitat findings emerge:

- Adjacent land management practices and direct actions within stream corridors have significantly altered natural stream ecological processes.
- Fine sediment (.85 mm) levels in stream gravels regularly exceed the <12% level identified as representing suitable spawning habitat (USFWS 1999).
- Lack of adequate LWD in streams, particularly larger key pieces needed to develop pools, log jams, and other habitat components important to salmonids.
- Lack of adequate pools, and large, deep pools important to rearing juvenile salmonids and supporting adult salmonids during their upstream migrations.
- Naturally high rates of channel constrictions, which further worsens the rate of streambank erosion and substrate instability due to loss of streambank and riparian integrity, and the alteration of natural hydrology.
- Loss of riparian function due to removal, or alteration, of natural riparian vegetation. This habitat loss affects water quality, lateral erosion, streambank stability, and instream habitat conditions.

- Presence of a significant number of barriers, such as culverts, screens, water diversions, and dams. Barriers prevent unrestricted upstream and downstream access to juvenile and adult salmonids.
- Significant alterations to natural stream hydrology in streams where uplands have been heavily developed. The threat of similar impacts to streams experiencing current and future development growth.
- Physical alteration of the natural estuary has significantly impacted estuarine/marine function. . For example, bulkheads may cause poor water quality and significantly alter nearshore ecological function.

The *Habitat Limiting Factors* reports provide environmental baseline information that can, and should, be used to develop salmonid habitat protection and restoration strategies. The Regional Program supports these strategies by developing BMPs that avoid and minimize impacts to aquatic habitats due to routine road maintenance activities.

It is not the intent of this BR, nor the Regional Program, to duplicate the Commission's work, but to help make the *Habitat Limiting Factors* reports available to state and local governments' environmental and road maintenance staff. Additional habitat assessment data and habitat restorations are incorporated into the Commission's existing documents, and therefore are considered to be living documents. The Regional Program Element 8: Adaptive Management (through the Regional Forum) allows this material to be passed on to state and local road maintenance agencies for use at their discretion.

Table 21: Summary of Habitat Limiting Factors Reports

Watershed	WRIA#	County	List of Maps or Tables: Location	Sub-basins	Land Use	Zoning	Neashore habitat & forage fish	Chinook Distribution	Chum Distribution	Coho Distribution	Steelhead Distribution	Sockeye Distribution	Bull Trout Distribution	Char Distribution	Searun Cutthroat Distribution	Coastal Cutthroat Trout Distribution	Cutthroat Trout Distribution	Barriers	Dikes, Levees, Revetments & Bank Stabilization	Impervious Area	Bulkheads	Irrigation Ditches, Water Diversions & Fish Screens	Side Channels	Historic Channel	Landowners	High & Low Flow Stream Problem Areas	Sediment Transport Zones with FPU's	Forest Age	Marine Areas	Floodplain Complexes	Riparian Condition & Road Density	Riparian Conditions	LWD Conditions &/or Channel Constrictions	Landslide Inventory	303D listings	Existing and Potential Wetlands	Current & Lost Estuary Wetlands	Limiting Factors	Appendix #
Nooksack	1	Whatcom & Skagit																																				
San Juan	2	San Juan																																				
Lower Skagit-Samish	3	Skagit & Snohomish																																				
Upper Skagit	4	Whatcom, Skagit & Snohomish																																				
Stillaguamish	5	Snohomish & Skagit	X	X	X			X	X	X	X	X		X	X			X	X					X							X		X	X	X	X	A- 1
Island	6	Island	X	X		X	X	X	X	X		X				X		X		X														X	X	X	A - 2
Snohomish	7	King & Snohomish																																				
Cedar-Sammamish	8	King	X	X			X	X		X	X	X					X	X		X								X	X							X	A - 3
Duwamish-Green	9	King & Kittitas. Includes Vashon Island which is located in WRIA 15.	X	X	X		X	X	X	X	X	X					X	X						X	X						X	X		X		X	A - 4
Puyallup-White	10	Pierce & King	X					X	X	X	X	X		X										X											X		X	A - 5
Nisqually	11	Pierce, Thurston & Lewis	X		X			X	X	X	X	X				X			X																	X	A - 6
Chambers-Clover	12	Pierce																																				
Deschutes	13	Thurston & Lewis	X		X			X	X	X	X							X			X									X				X		X	A - 7
Kennedy-Goldsborough	14	Mason & Thurston																																				
Kitsap	15	Kitsap, Pierce & Mason	X					X	X	X	X						X	X			X									X				X		X	A - 8
Skokomish-Dosewallips	16	Mason, Grays Harbor & Jefferson																																				
Quilcene-Snow	17	Jefferson & Clallam																																				
Elwah-Dungeness	18	Jefferson & Clallam	X		X			X	X	X	X								X		X												X			X	A - 9
Lyre-Hoko	19	Clallam	X															X												X		X	X		X	X	A - 10
Soleduck-Hoh	20	Jefferson & Clallam	X	X				X	X	X	X	X						X												X		X	X		X	X	A - 11
Queets- Quinault	21	Jefferson, Mason & Grays Harbor	X					X	X	X	X	X		X			X															X				X	A - 12
Lower Chehalis	22	Grays Harbor, Jefferson, Mason, Thurston & Pacific	X					X	X	X	X																					X	X				X	A - 13
Upper Chehalis	23	Grays Harbor, Thurston, Lewis & Pacific	X					X	X	X	X																					X	X				X	A - 14
Willapa	24	Pacific, Lewis & Wahkiakum	X					X	X	X	X							X													X	X	X		X	X	X	A - 15
Grays-Elokoman	25	Wahkiakum, Pacific, Cowlitz & Lewis																																				
Cowlitz	26	Pierce, Lewis, Cowlitz, Skamania & Yakima	X		X			X	X	X	X							X							X						X	X			X	X	A - 16
Lewis	27	Skamania, Clark, & Cowlitz	X					X	X	X	X		X					X							X	X			X		X			X		X	A - 17
Salmon-Washougal	28	Clark & Skamania	X					X	X	X	X							X							X	X					X	X			X	X	A - 18
Wind-White Salmon	29	Skamania, Klickitat & Yakima. 89% of the watershed is owned by the Federal Government.	X					X		X	X							X											X		X	X				X	A- 19
Klickitat	30	Klickitat & Yakima	X					X		X	X							X																		X	A - 20
Rock-Glade	31	Benton, Klickitat & Yakima	X					X		X	X																									X	A - 21
Walla Walla	32	Walla Walla & Columbia	X	X	X						X		X													X			X		X					X	A - 22
Lower Snake	33	Franklin & Walla Walla																																				
Palouse	34	Franklin, Adams, Lincoln, Spokane & Whitman																																				
Middle Snake	35	Columbia, Garfield, Asotin & Whitman																																				
Esauatzel Coulee	36	Franklin, Benton, Grant & Adams																																				
Lower Yakima	37	Yakima, Benton & Klickitat																																				
Naches	38	Yakima & Kittitas																																				
Upper Yakima	39	Yakima & Kittitas																																				
Alkali-Squilchuck	40	Yakima, Kittitas & Chelan																																				
Lower Crab	41	Douglas, Grant, Adams & Lincoln																																				
Grand Coulee	42	Grant, Douglas & Lincoln																																				
Upper Crab-Wilson	43	Grant, Lincoln & Spokane																																				
Moses Coulee	44	Douglas & Grant	X	X				X	X		X	X	X																								X	A - 23
Wenatchee	45	Chelan																																				
Entiat	46	Chelan. 84% is owned by National Forest.						X			X	X						X									X									X	A - 24
Chelan	47	Chelan & Okanogan																																				
Methow	48	Okanogan	X	X				X			X		X					X				X	X													X	A - 25
Okanogan	49	Okanogan & Douglas																																				
Foster	50	Okanogan & Douglas	X	X				X	X		X	X	X																								X	A - 26
Nespelem	51	Okanogan & Ferry																																				
Sanpoil	52	Okanogan & Ferry																																				
Lower Lake Roosevelt	53	Lincoln, Okanogan & Ferry																																				
Lower Spokane	54	Lincoln, Stevens & Spokane																																				
Little Spokane	55	Spokane, Stevens & Pend Oreille																																				
Hangman	56	Whitman & Spokane																																				
Middle Spokane	57	Spokane																																				
Middle Lake Roosevelt	58	Ferry & Stevens																																				
Colville	59	Stevens, Pend Oreille																																				
Kettle	60	Ferry & Stevens																																				
Upper Lake Roosevelt	61	Stevens																																				
Pend Oreille	62	Pend Oreille & Stevens																																				

Blue means a report and summary are available through the Washington State Conservation Commission web site http://www.conserver.org/salmon/reports/index.shtml

Burgundy means work is currently underway in this WRIA

Black means work has not started